

REMARKS

Preliminarily, applicant requests the examiner to acknowledge the claim for convention priority filed on August 29, 2003.

Status of the Claims

The Office Action mailed October 13, 2004, has been reviewed and the Examiner's comments have been carefully considered. Claims 1-14 were pending in the application. Claims 1, 3, and 14 have been amended, no claims have been canceled and claims 15-24 have been newly added. Therefore claims 1-24 are pending and are submitted for reconsideration.

This amendment changes and adds claims in this application. A detailed listing of all claims that are, or were, in the application, irrespective of whether the claim(s) remain under examination in the application, are presented, with an appropriate defined status identifier.

Preliminary Matter(s)

Preliminarily, applicant requests the examiner to acknowledge the claim for convention priority filed on August 29, 2003.

Prior Art Rejection

Claims 1-14 are rejected under 35 U.S.C. § 102(b) as being anticipated by Japanese patent document 08-104,219 (hereafter "Okazaki"). Applicant respectfully traverses this rejection for at least the following reasons.

Okazaki discloses a vehicular antiskid brake apparatus for estimating a master cylinder liquid pressure (Pm).

In more detail, Okazaki discloses a vehicular antiskid brake apparatus comprising: road wheel velocity detecting means for detecting the wheel velocities of road wheels; liquid pressure adjusting means for adjusting a brake liquid pressure of front and rear road wheels; and antiskid control means for controlling the liquid pressure adjusting means to vary the brake liquid pressure at a liquid pressure control cycle including at least a pressure increase phase and a pressure decrease phase on the basis of the road wheel velocities detected by the wheel velocity detecting means. Okazaki further discloses a vehicular body speed calculating means for calculating a vehicular body speed from the road wheel velocities detected by the wheel velocity detecting means; first liquid pressure detecting means for deriving a vehicular

body deceleration upon receipt of the vehicular body speed and detecting a first brake liquid pressure at a time at which the wheels are locked using the vehicular body deceleration. A second brake liquid pressure detecting means derives a pressure decrease time interval of the pressure decrease phase which decreases the pressure of the first brake liquid pressure and detects a second liquid pressure from the first brake liquid pressure and pressure decrease time interval. A third liquid pressure detecting means derives the vehicular body deceleration upon receipt of the vehicular body speed and detects a third brake liquid pressure at a time when the road wheels are locked at a next liquid pressure control cycle to the liquid pressure control cycle which derives the first brake liquid pressure using the vehicular body deceleration. A master cylinder liquid pressure estimating means derives a pressure increase time interval of the pressure increase phase which increases the pressure of the second brake liquid pressure and estimates a master cylinder liquid pressure using the second brake liquid pressure, the third brake liquid pressure, and the pressure increase time interval.

In summary, Okazaki discloses that an anti-skid brake apparatus is a prerequisite to the estimation of the master cylinder pressure as taught by Okazaki. In particular, Okazaki teaches that the estimation of the master cylinder pressure is carried out on the basis of the second brake liquid pressure after the pressure decrease from the first brake liquid pressure, the third brake liquid pressure, and pressure increase time interval.

In sharp contrast to Okazaki, claim 1 recites that the wheel cylinder pressures are estimated from two models, a brake liquid pressure section model and a vehicular model (first estimated liquid pressure and second estimated liquid pressure) and the master cylinder pressure liquid pressure estimated value is outputted to converge the master cylinder pressure estimated value into a true value thereof. In addition, the master cylinder pressure is estimated on the basis of the estimated wheel cylinder brake liquid pressure estimated values. Okazaki reference teaches the estimated master cylinder liquid pressure based on the brake liquid pressure at the time of the wheel locks and, therefore, the antiskid brake apparatus is a prerequisite in the teachings of Okazaki.

It should be noted that Okazaki teaches that MAP1 (Fig. 16) adopts the vehicular body deceleration Dvr. In sharp contrast, the pending independent claim 1 (and 14) recite that the vehicular model uses the value of wheel velocity (\dot{V}_w). Therefore, in the invention of these

claims, even if a relatively small wheel slip occurs to a degree such that the ABS control is not activated, the estimated liquid pressure can advantageously be measured in accordance with the wheel slip. However, in the case of Okazaki, since the state signals of the road wheels are not considered in MAP1, the liquid pressure correlation between the vehicle body deceleration and the wheel cylinders is not taken so that the accurate estimated liquid pressure cannot be obtained in this situation.

In place of the master cylinder, the pressure increase of the brake liquid by means of a pump can be considered. Specifically, the pressure increase of the brake liquid by means of the pump is carried out in a VDC (Vehicle Dynamic Control) not requiring the brake manipulation and a Brake-By-Wire in which the brake pedal and the wheel cylinders are independently separated from each other.

Therefore, in the claimed invention (as recited in claims 1 and 14), the estimation of the brake liquid pressure is possible even if the brake system (ABS or VDC) is not operated. This is a great advantage in the claimed invention. Especially, since the road wheel velocity is used, an accurate estimation of the master cylinder liquid pressure is possible even if the brake system is not operated.

The dependent claims are also in condition for allowance for at least the same reasons, as discussed above, as the independent claims on which they ultimately depend. In addition, they recite additional patentable features when considered as a whole.

The new independent claims 15, 16, 20, 21, and 22 also recite features that are not disclosed by the applied prior art and also believed to be in condition for allowance.

Conclusion

In view of the foregoing amendments and remarks, applicant believes that the application is in condition for allowance. If there are any questions regarding the application, or if an examiner's amendment would facilitate the allowance of one or more of the claims, the examiner is courteously invited to contact the undersigned attorney at the local telephone number below.

Should additional fees be necessary in connection with the filing of this paper, or if a petition for extension of time is required for timely acceptance of same, the Commissioner is hereby authorized to charge deposit account No. 19-0741 for any such fees; and applicant hereby petitions for any needed extension of time.

Respectfully submitted,

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